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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,575	05/31/2001	Mark A. Gogins	758.1219US01	3512

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EXAMINER
GREENE, JASON M

ART UNIT	PAPER NUMBER
1724	12

DATE MAILED: 04/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/871,575	Applicant(s) GOGINS ET AL.	
	Examiner Jason M. Greene	Art Unit 1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,35 and 45-55* is/are rejected.

7)☒ Claim(s) *10-32 and 36-44* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *9* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

Response to Arguments

1. Applicant's arguments filed 23 January 2003 have been fully considered but they are not persuasive.

With regard to Applicants' argument that the support layer of Kahlbaugh et al. '399 is a non-filtration layer, the Examiner contends that the substrate layer of Kahlbaugh et al. '399 is a filtration layer. As disclosed in col. 14, line 60 to col. 15, line 6, the support layer of Kahlbaugh et al. '399 can have a filtration efficiency of about 10 percent. While Kahlbaugh et al. '399 teaches the support layer having a relatively low filtration efficiency compared to the fine fiber layers, the Examiner notes that the support layer is still a filtration layer since it will capture about 10 percent of the particulate matter that enters it. Furthermore, the Examiner notes that the support layer of Kahlbaugh et al. '399 satisfies the structural limitations used by Applicants to define a support layer as a filtration layer. Kahlbaugh et al. '399 discloses the substrate layer having a permeability of 450 meters per minute, a basis weight of 45 g/m^2, and a thickness of 254 microns in col. 15, line 3 to col. 16, line 2.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-8 and 45-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raether in view of Kahlbaugh et al. '399.

With regard to claim 1, Raether discloses an air filter assembly comprising a housing (10) including an air inlet (11), an air outlet (12), a spacer wall (28) separating said housing into a filtering chamber (22) and a clean air chamber (60), said spacer wall including a first air flow aperture therein, a first filter construction (32) positioned in air flow communication with said first air flow aperture in said spacer wall, said first filter construction including an extension of a pleated filter media composite defining a filter construction inner clean air chamber, said first filter construction being oriented with said filter inner clean air chamber in air flow communication with said spacer wall first air flow aperture, and a pulse-jet cleaning system (65,70) oriented to direct a pulse of air into said filter construction inner clean air chamber in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 18.

Raether does not disclose the pleated filter media composite including a substrate, the substrate having a permeability of about 2 to 900 meters per minute, a basis weight of not greater than 200 g/m^2, and a thickness of 25 to 800 microns, the

substrate at least partially covered by a layer of fine fiber having a thickness of about 1-8 times the fine fiber diameter, said fiber comprising a diameter of about 0.01 to 0.5 microns that after exposure for a test period of 16 hours to test conditions of 140 ^{0}F air and a relative humidity of 100% retains greater than 30% of the fiber unchanged for filtration purposes.

Kahlbaugh et al. '399 discloses a similar filter assembly having a filter media comprising a pleated filter media composite including a substrate (31) having a permeability of about 450 meters per minute, a basis weight of 45 g/m^2, and a thickness of 254 microns, the substrate at least partially covered by a layer of fine fiber (32) having a thickness of about 1-8 times the fine fiber diameter, said fiber comprising a diameter of 0.1 microns in Figs. 8-11, col. 4, lines 12-26, col. 14, line 35 to col. 17, line 28, and col. 25, line 5 to col. 27, line 32.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter media of Kahlbaugh et al. '399 into the air filter assembly of Raether to provide an improved filter media having a longer lifetime at a given efficiency and flow rate, as suggested by Kahlbaugh et al. '399 in col. 1, line 3 to col. 3, line 35 and col. 9, line 15 to col. 11, line 28.

With regard to the thermal and humidity resistance of the fine fibers, both Applicants and Kahlbaugh et al '399 disclose forming the fine fiber layer of the same materials. Specifically, Applicants teach forming the fine fiber layer from polyolefin, polyvinyl chloride (PVC), cellulose ester, polyacrylonitrile, polyamides, polystyrene, polysulfones, polyvinylidene fluoride, polyvinylidene chloride, or nylon in page 12, line

13 to page 13, line 27. Kahlbaugh et al. '399 teaches forming the fine fibers from identical materials in page 16, lines 53-64. Since Applicants and Kahlbaugh et al '399 both teach the fine fiber layer being formed from the same material, the fine fibers of Kahlbaugh et al. '399 would inherently have the same heat and humidity resistance properties as the fine fibers of the present invention.

With regard to claims 2 and 3, Kahlbaugh et al. '399 discloses the fine fiber comprising the condensation polymers nylon and cellulose ether in col. 16, lines 53-64.

With regard to claims 2 and 4-8, Kahlbaugh et al. discloses the fine fiber comprising the addition polymers polyvinyl chloride, polyvinylidene chloride, and polyvinylidene fluoride in col. 16, lines 53-64.

With regard to claim 45, Raether discloses the air filter assembly further including a first Venturi element (70) mounted in said spacer wall first air flow aperture and positioned to project into said first filter construction inner clean air chamber, and wherein said pulse cleaning system includes a first blowpipe (65) oriented to direct a pulse of air into said first Venturi element from said clean air chamber and toward said first filter construction in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 52.

With regard to claim 46, Raether discloses the first filter construction including a first end cap (82) having a central aperture, said extension of filter media being embedded within the first end cap in Fig. 7 and col. 4, line 62 to col. 5, line 4.

With regard to claim 47, Raether discloses the first filter construction including first and second filter elements (32) in axial alignment, said extension of pleated filter media composite comprising a first extension of media in said first filter element and a second extension of media in said second filter element in Fig. 2 and col. 5, lines 16-18.

With regard to claims 48 and 49, Raether discloses the spacer wall (28) including a second air flow aperture therein, and the assembly further including a second filter construction positioned in air flow communication with the second air flow aperture in said spacer wall, said second filter construction including an extension of a pleated filter media composite defining a second filter construction inner clean air chamber, said second filter construction being oriented with said second filter inner clear air chamber in air flow communication with said spacer wall second air flow aperture, a second Venturi element (70) mounted in said spacer wall second air flow aperture and positioned to project into said second filter construction inner clean air chamber, a second blow pipe (65) oriented to direct a pulse of air into said second Venturi element from said clean air chamber and toward said second filter construction in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 18.

Raether does not disclose the pleated filter media composite of said second filter construction including a substrate at least partially covered by a layer of fine fiber.

Kahlbaugh et al. '399 discloses a similar filter assembly having a filter media comprising a pleated filter media composite including a substrate (31) at least partially covered by a layer of fine fiber (32), said fiber comprising a diameter of 0.1 microns in Figs. 8-11, col. 14, line 35 to col. 17, line 28, and col. 25, line 5 to col. 27, line 32.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter media of Kahlbaugh et al. '399 into the air filter construction of Raether to provide an improved filter media having a longer lifetime at a given efficiency and flow rate, as suggested by Kahlbaugh et al. '399 in col. 1, line 3 to col. 3, line 35 and col. 9, line 15 to col. 11, line 28.

4. Claims 9 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raether and Kahlbaugh et al. '399 as applied to claims 3 and 4 above, and further in view of Emig et al.

Raether and Kahlbaugh et al. '399 do not disclose the fine fiber comprising polyvinyl alcohol or polyurethane.

Emig et al. discloses a similar filter media having a layer of fine fiber supported on a substrate wherein the fine fiber comprises polyvinyl alcohol in col. 2, lines 26-65.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the polyvinyl alcohol or polyurethane fine fibers of Emig et al. into the filter media of Raether and Kahlbaugh et al. '399 in that such are

merely alternate materials in the art for forming a layer of fine fibers, mere substitution of one known fine fiber forming material for another in the art without a showing of unobvious or unexpected results being within the scope of one having ordinary skill in the art.

5. Claims 50-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raether in view of Kahlbaugh et al. '399.

With regard to claim 50, Raether discloses a method for filtering air comprising directing the air through an inlet (11) of a housing (10) and into a filtering chamber (22), the housing including a spacer wall (28) separating the filtering chamber from a clean air chamber (60), the spacer wall including a first air flow aperture therein, after directing the air into the filtering chamber, directing the air through an extension of a pleated filter media composite of a first filter construction (32) and into a filter construction inner clean air chamber, the first filter construction being positioned in air flow communication with the first air flow aperture in the spacer wall, the extension of a pleated filter media composite defining the filter construction inner clean air chamber, the first filter construction being oriented with the filter inner clean air chamber in air flow communication with the spacer wall first air flow aperture, and after directing the air through an extension of a pleated filter media composite of a first filter construction and into a filter construction inner clean air chamber, directing the air into the clean air

chamber and out (12) of the housing in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 18.

Raether does not disclose the air having a temperature of at least 140 ^{0}F or the pleated filter media composite including a substrate, the substrate having a permeability of about 2 to 900 meters per minute, a basis weight of not greater than 200 g/m^2, and a thickness of 25 to 800 microns, the substrate at least partially covered by a layer of fine fiber, said fiber comprising a diameter of about 0.01 to 0.5 microns, the layer having a thickness of about 1-8 times the fine fiber diameter, such that after exposure for a test period of 16 hours to test conditions of 140 ^{0}F air and a relative humidity of 100% retains greater than 30% of the fiber unchanged for filtration purposes.

Kahlbaugh et al. '399 discloses a similar filter assembly having a filter media comprising a pleated filter media composite including a substrate (31) having a permeability of 450 meters per minute, a basis weight of 45 g/m^2, and a thickness of 254 microns, the substrate at least partially covered by a layer of fine fiber (32), said fiber comprising a diameter of 0.1 microns, the layer having a thickness of about 1-8 times the fine fiber diameter in Figs. 8-11, col. 14, line 35 to col. 17, line 28, and col. 25, line 5 to col. 27, line 32.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the filter media of Kahlbaugh et al. '399 into the air filter assembly of Raether to provide an improved filter media having a longer lifetime at

a given efficiency and flow rate, as suggested by Kahlbaugh et al. '399 in col. 1, line 3 to col. 3, line 35 and col. 9, line 15 to col. 11, line 28.

With regard to the thermal and humidity resistance of the fine fibers, both Applicants and Kahlbaugh et al '399 disclose forming the fine fiber layer of the same materials. Specifically, Applicants teach forming the fine fiber layer from polyolefin, polyvinyl chloride (PVC), cellulose ester, polyacrylonitrile, polyamides, polystyrene, polysulfones, polyvinylidene fluoride, polyvinylidene chloride, or nylon in page 12, line 13 to page 13, line 27. Kahlbaugh et al. '399 teaches forming the fine fibers from identical materials in page 16, lines 53-64. Since Applicants and Kahlbaugh et al '399 both teach the fine fiber layer being formed from the same material, the fine fibers of Kahlbaugh et al. '399 would inherently have the same heat and humidity resistance properties as the fine fibers of the present invention.

While Raether and Kahlbaugh et al. '399 do not explicitly disclose the air having a temperature of at least 140 ^{0}F, it would have been obvious to one of ordinary skill in the art at the time the invention was made to operate the method of Raether and Kahlbaugh et al. '399 at a temperature of at least 140 ^{0}F since the media composite is designed to handle such conditions.

With regard to claim 51, Raether discloses the method further including directing a pulse of air (65) into the filter construction inner clear air chamber to at least partially remove particulates collected on the pleated filter media composite in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 52.

With regard to claim 52, Raether discloses the step of directing a pulse of air into the filter construction inner clear air chamber to at least partially remove particulates collected on the pleated filter media composite including directing the pulse of air into a Venturi element (70) mounted to project into the first filter construction inner clean air chamber in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 52.

With regard to claim 53, Raether discloses the housing spacer wall including a plurality of extensions of pleated filter media composites of a plurality of filter constructions (32) wherein each of the extensions of a pleated filter media composites define a respective filter construction inner clean air chamber in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 52.

With regard to claim 54, Raether discloses directing a pulse of air (65) into each of the filter construction inner clear air chambers to at least partially remove particulates collected on each of the pleated filter media composites in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 52.

With regard to claim 55, Raether discloses the step of directing a pulse of air (65) into each of the filter construction inner clear air chambers to at least partially remove particulates collected on each of the pleated filter media composites including directing the pulse of air into a plurality of Venturi elements (70) each mounted to project into a

respective filter construction inner clean air chamber in Figs. 1, 2, 7, and 8 and col. 3, line 22 to col. 8, line 52.

Allowable Subject Matter

6. Claims 10-32 and 36-44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (703) 308-6240. The examiner can normally be reached on Tuesday - Friday (7:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jason M. Greene
Examiner
Art Unit 1724

jmg
April 1, 2003

DUANE SMITH
PRIMARY EXAMINER
4-2-03